What is claimed is:

1. A method for use in a receiver for detecting and demodulating at least one signal of M-ary orthogonal symbols (MOK) comprising the steps of:

a. receiving coded M-ary orthogonally modulated symbols over a channel;

b. demodulating said M-ary orthogonally modulated symbols;

c. calculating a metric;

d. decoding said symbols;

e. calculating probabilities of different symbols for each symbol instance;

f. estimating a fading channel responsive to calculating the probabilities; and

g. iteratively feeding said metric, said decoded symbols, said probabilities and said estimate back into said demodulating step to re-demodulate said symbols coherently.

2. The method according to claim 1, wherein said coded M-ary orthogonally modulated symbols are convolutionally coded.

3. The method according to claim 1, wherein a first instance of said demodulating step is performed noncoherently and each succesive instance of said demodulating step for said signal is performed coherently.

4. The method according to claim 1, further comprising the steps of:

a. testing the decoded signal for recognition improvement; and

b. repeating steps b through f iteratively until no recognition improvement is detected.

5. The method according to claim 1, further comprising the steps of:

a. testing the decoded signal for recognition improvement; and

b. repeating steps b through f iteratively a preset threshold of the recognition improvement is attained.

6. The method according to claim 1, further comprising the step of de-interleaving.

Sub A1

7. The method according to claim 1, wherein said metric is a log likelihood ratio.

8. The method according to claim 6, wherein said log likelihood ratio is approximated by choosing a maximum term in a summation wherein said summation can be one of a summation of exponentials, modified Bessel functions and a product of both.

9. The method according to claim 1, further comprising the step of calculating chip probabilities after the step of calculating symbol probabilities.

10. The method according to claim 1, wherein said estimating step is accomplished using a filter.

11. The method according to claim 9, wherein said filter is a Weiner filter.

12. The method according to claim 1, wherein said estimating step is performed in a first instance using only a known first chip and following a first instance of said decoding step, unknown chips being also used to estimate the fading channel.

13. A method for a receiver for detecting and demodulating at least one signal of complementary code keying (CCK) symbols comprising the steps of:

a. receiving complementary coded keying (CCK) modulated symbols over a channel;
b. demodulating said complementary code keying modulated symbols;
c. decoding said symbols;
d. adding an extra known chip at a beginning of every symbol;
e. calculating probabilities of different symbols for each symbol instance;
f. calculating expected values of complex conjugates of every chip;
g. estimating the fading channel at different chip positions within said symbol;
h. iteratively feeding said decoded symbols, said probabilities and said estimate back into said demodulating step to re-demodulate said symbols.

14. The method according to claim 12, wherein a first instance of said demodulating step is performed noncoherently and each succesive instance of said demodulating step for said signal is performed coherently.

15. The method according to claim 12, further comprising the steps of:

a. determining an argument of a maximum of said signal and a value of said maximum signal;

b. further determining a plurality of first bits of a code; and

c. independently differentially demodulating remaining bits of said code.

16. The method according to claim 12, further comprising the steps of:

a. testing the decoded signal for recognition improvement; and

b. repeating steps b through f iteratively until no recognition improvement is detected.

17. The method according to claim 12, further comprising the steps of:

a. testing the decoded signal for recognition improvement; and

b. repeating steps b through f iteratively a preset threshold of the recognition improvement is attained.

18. The method according to claim 10, wherein said estimating step is accomplished using a filter.

19. The method according to claim 13, wherein said filter is a Weiner filter.

20. The method according to claim 12, wherein said estimating step is performed in a first instance using only a known first chip and following a first instance of said decoding step, unknown chips being also used to estimate the fading channel.